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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/586,602

07/20/2006

Yoshiyuki Muraoka

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EXAMINER

ARCIERO, ADAM A

ART UNIT

PAPER NUMBER

1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,602	Applicant(s) MURAOKA ET AL.	
	Examiner ADAM A. ARCIERO	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 July 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/20/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. This is the initial Office action based on the Nonaqueous Electrolyte Secondary Battery application filed on 7/20/2006.
2. Claims 1-4 are currently pending and have been fully considered.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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3. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over HOSOYA et al. (US 2004/0076882 A1 as found in IDS dated 07/20/2006).

As to Claims 1-2, HOSOYA et al. discloses a lithium-ion battery (nonaqueous electrolyte battery) comprising a negative electrode having an active material such as graphite which is capable do dope and dedope lithium (pg. 4, [0057]), A positive electrode having a positive active material of a first active material and a second active material of lithium transition metal oxides (pg. 4, [0046]), a nonaqueous electrolyte (pg. 4, [0039]) and a separator (pg. 4, [0039]). The second lithium transition metal oxide has an average discharge voltage of at least 0.05V or more than that of the first lithium transition metal oxide (pg. 2, [0018]) and the preferred amount of the second lithium transient metal oxide is in the range of 4-50% (pg. 9, [0124]). This prior art range overlaps the claimed range of 5-20%. The courts have held that in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, HOSOYA et al. teaches the mixing ratio as being a results effective variable in that when the range is less than 4% it is difficult to sufficiently lower the cathode potential causing degradation of over-discharge resistance, and wherein second composite oxide material is greater than 50%, a discharge curve is shifted toward a low voltage side, and the battery becomes susceptible to lowering of battery capacity (pg. 9, [0124]). The courts have held that optimization of a results effective variable is not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Furthermore, since the nonaqueous battery of HOSOYA et al. is very similar to the claimed battery of claims 1 and 2, the discharge curve of the battery of HOSOYA et al. inherently has at least two step-like flection points in a region ranging from 5-20% at the end of electrical discharge.

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4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over HOSOYA et al. (US 2004/0076882 A1) as applied to claims 1 and 2, and further in view of UENAE (JP 2004-362777 A as found in IDS dated 07/20/2006).

As to Claim 3, the disclosure of HOSOYA et al. as discussed above in claim 2 is incorporated herein. HOSOYA et al. further discloses the first active material of a lithium composite oxide as being LiCoO_2 (Example 44). The composition of Li does not overlap the claimed range but is very close. The courts have held that a *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). HOSOYA et al. does not expressly disclose the second active material as being LiMnO_2 . However, UENAE teaches of a lithium-ion battery comprising a positive active material such as LiMnO_2 (paragraph [0013]). At the time of the invention, a person having ordinary skill in the art would have found it obvious to substitute LiMnO_2 for the second positive active material of HOSOYA et al. so as to give the rechargeable battery good load characteristics, as taught by UENAE (paragraph [0008]).

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over HOSOYA et al. (US 2004/0076882 A1) in view of UENAE (JP 2004-362777 A as found in IDS dated 07/20/2006) as applied to claim 3 above, and further in view of OHZUKU et al. (US 2003/0087154 A1).

As to Claim 4, the combination of HOSOYA et al. and UENAE do not expressly disclose the composition of the first active material expressed in claim 4. HOSOYA et al. teaches

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LiCoO₂ as being a first active material (Example 44). However, OHZUKU et al. teaches a nonaqueous electrolyte battery comprising a positive active material of Li[Co_x(Ni_{0.67}Mn_y)_{1-x}]O₂ where $-0.1 \leq x \leq 0.5$, $y = 0.5 \pm 0.1$ (claim 6). These ranges overlap or lie inside the claimed ranges of the present application. The courts have held that in the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). OHZUKU et al. further teaches when using LiCoO₂ as an active material and graphite as the negative material, the lattice volume of the positive material increases with charging, and graphite also expands because of the lithium ions intercalating between the layers. Therefore, both the positive and negative electrodes expand, which can crush the separator causing internal short-circuit (pg. 5, [0075]). OHZUKU et al. further teaches that polarization characteristics are improved with the positive active material of Li[Co_x(Ni_{0.67}Mn_y)_{1-x}]O₂ over that of LiCoO₂ (pg. 16, [0227] and Table 4). Therefore, at the time of the invention, a person having ordinary skill in the art would have found it obvious to substitute the active material of OHZUKU et al. for the first active material (LiCoO₂) of HOSOYA et al. and UENAE so as to achieve a battery with a high capacity, long storage life and excellent cycle life, and while reducing expansion of the layers, as suggested by OHZUKU et al. (Abstract and pg. 5, [0075]).

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADAM A. ARCIERO whose telephone number is (571)270-5116. The examiner can normally be reached on Monday to Friday 8am to 5pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795

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